CLAIMS:

1. A method of metal doping a chalcogenide material comprising:

forming a metal over a substrate;

forming a chalcogenide material on the metal; and

irradiating through the chalcogenide material to the metal effective to break a chalcogenide bond of the chalcogenide material at an interface of the metal and chalcogenide material and diffuse at least some of the metal outwardly into the chalcogenide material.

2. The method of claim 1 wherein the metal comprises elemental silver.

3. The method of claim 1 wherein the chalcogenide material having metal ions diffused therein comprises Ge_xA_y, where A is selected from the group consisting of Se, Te and S, and mixtures thereof.

4. The method of claim 1 wherein the irradiating diffuses only some of the metal outwardly into the chalcogenide material.

5. The method of claim 1 wherein the irradiating diffuses all of the metal outwardly into the chalcogenide material.

6. A method of metal doping a chalcogenide material comprising:

surrounding exposed outer surfaces of a projecting metal mass with chalcogenide material; and

irradiating through the chalcogenide material to the projecting metal mass effective to break a chalcogenide bond of the chalcogenide material at an interface of the projecting metal mass outer surfaces and diffuse at least some of the projecting metal mass outwardly into the chalcogenide material.

7. The method of claim 6 wherein the projecting mass and outer surfaces comprises a top surface joined with opposing side surfaces at respective angles.

8. The method of claim 6 wherein the projecting mass and outer surfaces comprises a top surface joined with opposing side surfaces at respective angles within about 15° degrees of normal.

9. The method of claim 6 wherein the irradiating diffuses only some of the projecting metal mass outwardly into the chalcogenide material.

10. The method of claim 6 wherein the irradiating diffuses all of the projecting metal mass outwardly into the chalcogenide material.

11. The method of claim 6 wherein the projecting metal mass has a shape which is maintained after the irradiating but at a reduced size.

12. The method of claim 6 wherein the surrounding comprises blanket depositing of the chalcogenide material.

13. A method of metal doping a chalcogenide material comprising:

forming a metal over a substrate;

patterning the metal into a structure having an outer surface;

forming a chalcogenide material on the metal structure outer surface; and

irradiating through the chalcogenide material to the patterned metal effective to break a chalcogenide bond of the chalcogenide material at an interface of the patterned metal outer surface and the chalcogenide material and diffuse at least some of the metal outwardly into the chalcogenide material.

14. The method of claim 13 wherein the patterning is subtractive of the metal.

15. The method of claim 13 wherein the patterning comprises photolithography.

16. The method of claim 13 wherein the irradiating diffuses only some of the metal outwardly into the chalcogenide material.

17. The method of claim 13 wherein the irradiating diffuses all of the metal outwardly into the chalcogenide material.

18. The method of claim 13 wherein the structure has a shape which is maintained after the irradiating but at a reduced size.

19. A method of metal doping a chalcogenide material comprising:

forming a metal over a substrate;

patterning the metal into a structure having an outer surface;

blanket depositing a chalcogenide material over the substrate and on the metal structure outer surface;

irradiating through the chalcogenide material to the patterned metal effective to break a chalcogenide bond of the chalcogenide material at an interface of the patterned metal outer surface and the chalcogenide material and diffuse at least some of the metal outwardly into the chalcogenide material, and thereby metal doping only a portion of the blanket deposited chalcogenide material; and

substantially selectively etching chalcogenide material not doped with the metal from the metal doped portion of the chalcogenide material.

20. The method of claim 19 wherein the depositing comprises chemical vapor deposition.

21. The method of claim 19 wherein the forming comprises a blanket deposition.

22. The method of claim 19 wherein the etching comprises dry anisotropic etching.

23. The method of claim 19 wherein the etching comprises dry anisotropic etching using a gas chemistry comprising CF_4.

24. The method of claim 19 wherein the irradiating diffuses only some of the metal outwardly into the chalcogenide material.

25. The method of claim 19 wherein the irradiating diffuses all of the metal outwardly into the chalcogenide material.

26. The method of claim 19 wherein the structure has a shape which is maintained after the irradiating but at a reduced size.

27. The method of claim 19 wherein the etching removes all chalcogenide material not doped with the metal from the substrate.

28. A method of forming a non-volatile resistance variable device, comprising:

surrounding exposed outer surfaces of a projecting metal mass with chalcogenide material;

irradiating through the chalcogenide material to the projecting metal mass effective to break a chalcogenide bond of the chalcogenide material at an interface of the projecting metal mass outer surfaces and diffuse at least some of the projecting metal mass outwardly into the chalcogenide material; and

after the irradiating forming an outer electrode over the chalcogenide material.

29. The method of claim 28 wherein the projecting metal mass and outer surfaces comprises a top surface joined with opposing side surfaces at respective angles.

30. The method of claim 28 wherein the projecting metal mass and outer surfaces comprises a top surface joined with opposing side surfaces at respective angles within about 15° degrees of normal.

31. The method of claim 28 wherein the projecting metal mass has a shape which is maintained after the irradiating but at a reduced size.

32. The method of claim 28 wherein the surrounding comprises blanket depositing of the chalcogenide material.

33. A method of forming a non-volatile resistance variable device, comprising:

forming a first metal layer over a substrate;

forming a second metal layer on the first metal layer;

patterning the second metal layer into a structure having an outer surface, and exposing the first metal layer;

blanket depositing a chalcogenide material over the substrate on the second metal structure outer surface and on the exposed first metal layer;

irradiating through the chalcogenide material to the patterned second metal effective to break a chalcogenide bond of the chalcogenide material at an interface of the patterned second metal outer surface and the chalcogenide material and diffuse at least some of the second metal outwardly into the chalcogenide material, and thereby second metal doping only a portion of the blanket deposited chalcogenide material;

substantially selectively etching chalcogenide material not doped with the second metal from the second metal doped portion of the chalcogenide material; and

after the etching, forming an outer electrode over the chalcogenide material.

34. The method of claim 33 wherein the etching comprises dry anisotropic etching.

35. The method of claim 33 wherein the etching comprises dry anisotropic etching using a gas chemistry comprising CF_4.

36. The method of claim 33 wherein the irradiating diffuses only some of the metal outwardly into the chalcogenide material.

37. The method of claim 33 wherein the structure has a shape which is maintained after the irradiating but at a reduced size.

38. A non-volatile resistance variable device, comprising:

a substrate comprising a first metal layer;

an insulative layer received over the first metal layer;

a resistance variable chalcogenide material having metal ions diffused therein received within an opening formed through the insulative layer;

a projecting metal mass extending outwardly from the first metal layer laterally central into the resistance variable chalcogenide material; and

an electrode spaced from the projecting metal mass and first metal layer operatively adjacent the resistance variable chalcogenide material.

39. The device of claim 38 in a highest resistance state for a given ambient temperature and pressure.

40. The device of claim 38 wherein the projecting metal mass comprises a top surface joined with opposing side surfaces at respective angles.

41. The device of claim 38 wherein the projecting metal mass comprises a top surface joined with opposing side surfaces at respective angles within about 15° degrees of normal.

42. The device of claim 38 wherein the metal mass comprises elemental silver.

43. The device of claim 38 wherein the chalcogenide material having metal ions diffused therein comprises Ge_xA_y, where A is selected from the group consisting of Se, Te and S, and mixtures thereof.

44. A non-volatile resistance variable device in a highest resistance state for a given ambient temperature and pressure, comprising:

a resistance variable chalcogenide material having metal ions diffused therein; and

opposing first and second electrodes received operatively proximate the resistance variable chalcogenide material, at least one of the electrodes comprising a conductive projection extending into the resistance variable chalcogenide material.

45. The device of claim 44 wherein the conductive projection comprises a top surface joined with opposing side surfaces at respective angles.

46. The device of claim 44 wherein the conductive projection comprises a top surface joined with opposing side surfaces at respective angles within about 15° degrees of normal.

47. The device of claim 44 wherein the one electrode and the conductive projection comprise the same material.

48. The device of claim 44 wherein the one electrode and the conductive projection comprise elemental silver.

49. The device of claim 44 wherein the conductive projection comprises elemental silver.

50. The device of claim 44 wherein the chalcogenide material having metal ions diffused therein comprises Ge_xA_y, where A is selected from the group consisting of Se, Te and S, and mixtures thereof.